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A POPULAR TREATISE ON THE COMMON INDIAN
SNAKES.

ILLUSTRATED BY COLOURED PLATES AND DIAGRAMS.

BY

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Part XII with Plate XII and Diagram and Map.

(Continued from page 563 of this Volume.)

The genus *Dendrophis* as now understood comprises at least 11 species, distributed in Southern Asia between India and Indo-China, through the Malayan Archipelago to Eastern Australia. Of these species 6 occur within our Indian limits, *viz.* (1) *pictus* (Eastern Bengal, Eastern Himalayas, Irrawaddy-Salween basin, and Tenasserim and further East to Indo-China), (2) *grandoculis* (Hills of Southern India), (3) *bifrenalis* (Ceylon and Travancore Hills, Ferguson), (4) *caudolineatus* (Ceylon), (5) and (6) *gorei*,* and *proarcho†* (Brahmaputra basin).

Until 1890 several other species were included which have now been grouped together on characters affecting dentition under a separate genus called *Dendrelaphis* by Mr. Boulenger. This genus includes 3 species found in Indian Territory, *viz.* (1) *tristis* (Peninsular India, Eastern Himalayas, Brahmaputra Valley and Ceylon); (2) *subocularis* (Hills of Upper Burma); and (3) *biloreatus‡* (Brahmaputra Basin).

* Described by me in this Journal, Vol. XIX., p. 829. † Described by me in this Journal, Vol. XIX., p. 827.

‡ Described by me in this Journal, Vol. XVIII., p. 273.

The species of both genera are very much alike, so much so indeed that some have been much confused. For instance every author who wrote before Mr. Boulenger's present classification was inaugurated, alluded to *Dendrelaphis tristis*, and *Dendrophis pictus* as one and the same snake under the latter title, and the confusion did not end here, for every writer since has committed the same mistake.

I have heard doubts expressed in some quarters as to the justification for the recognition of the two genera just referred to, but as I have a series of skulls of the types of both, I am in a position to be able not only to affirm that the differences claimed exist, but to add others in support. Mr. Boulenger divided the species on characters affecting the maxillary teeth, grouping together those in which the teeth enlarged posteriorly under the heading *Dendrophis*, and those in which they reduced posteriorly under the title *Dendrelaphis*. Figures A. and B. taken from the skulls of specimens of both obtained at Pashok in the Eastern Himalayas illustrate the differences in dentition, but I find in addition that there are decided differences in the shape of the nasal bones, and also in the ridges for muscular attachment on the parietal bones of each (see Diagram and figs. A. and B.). The confusion in literature between *D. tristis* and *D. pictus* just referred to makes it difficult for me to speak very positively on the distribution of these species, but I present the facts as they appear to me, with the hope that our readers who are in a position to do so will send me specimens that will enable me to confirm or refute them.

DENDRELAPHIS TRISTIS (Daudin.)

The Indian Bronze-Backed Tree Snake.

History.—The first reference to this snake was made by Russell over a century ago. In 1796* he figured and remarked upon a specimen from Hyderabad (Deccan). In 1801 † he figured and referred to two others from Bombay and Tranquebar.

Nomenclature.—(a) *Scientific.*—The generic name from the Greek δένδρον a tree, and ελαφίς snake, was introduced by Mr. Boulenger in 1890. *Tristis*, the specific title from the Latin "sad" was conferred by Daudin in 1803 in allusion to its sombre colouration.

(b) *English.*—The Common Indian Bronze-Backed Tree Snake or

* Ind. Serp. Vol. 1, p. 86 and Plate XXXI. † Vol. 11, pp. 29 and 30 and Plates XXV and XXVI.

Bronze Back. I have heard it alluded to as the painted tree snake, but since all the species are alike in the cærulean adornment which suggested the term painted, this adjective is equally applicable to all.

(c) *Vernacular*—In Ceylon Ferguson* says it is called “haldanda.” Mr. E. E. Green interrogated two intelligent Singhalese with respect to this term, and they said they knew a snake of this name which they described as “a very swiftly moving snake of a dark-brown colour,” and said it had a yellow belly. The word is from “hal” rice and “danda” a stick or whip. The connection is not very obvious but an observation of Annandale and Robinson’s with regard to the snake *D. pictus* suggests itself. They remark that it is often found among bushes at the edge of rice fields. One of the two men above referred to told Mr. Green it is also called “katta-kaluwa,” meaning black mouthed, but whether this name is rightly applied to this species seems dubious, as it does not appear appropriate. Ferguson † mentions this term in his list of Singhalese names for snakes, but without specifying the species.

Confusion in vernacular nomenclature with regard to snakes is great, thus we find another Singhalese name, *viz.*, “ahaetulla” wrongly applied to this species. Linné ‡ in 1754, Laurenti § in 1768 and others since have made use of the term in reference to the snake now identified by Boulenger as *D. pictus*, but it is clear that the word emanating from Ceylon refers rather to the Ceylon snake *tristis*. There is however, now, I think no doubt that “ahaetulla” is the correct Singhalese name for the green whip-snake (*Dryophis mycterizans*), the word implying eyeplucker being synonymous with the “kankotti-pambu” of the Tamils in Southern India. Further confusion has arisen with regard to the name “kumberi-muken.” Russell ¶ connects this name with the snake *D. tristis*, and many others subsequently have followed him, but I think there can be no doubt that it is correctly applied to the green whip-snake (*D. mycterizans*). The name meaning “snouted tree snake” obviously suggests the green whip-snake, and is quite inappropriate to the common bronze-back. Moreover, in a printed copy of a lecture on snakes delivered some years ago by the Rev. Fr. Bertram, S. J., of which I have a copy, this authority says “I believe these two different names (kan-

* Rept. fauna of Ceylon, 1877, p. 20,
Plate XXII., fig. 3. § Syn. Rept., p. 79.

† loc. cit. p. 40.

‡ Mus. Ad. Frid p. 35.

¶ Ind. Serp. Vol. I, p. 36 and Plate XXXI.

kotti-pambu and kamberi-mukken) denote the same snake; for, while the kan-kotti-pambu is acknowledged by all to be the green tree-snake, there is no other tree-snake with an elongated snout which would justify the name kamberi-mukken." Further, the Revd. C. Leigh, s. J., who has 13 years' experience of Trichinopoly, recently wrote to me in response to my enquiries that green whip-snakes were frequently kept in captivity at St. Joseph's College, and the students and visitors repeatedly applied the name kamberi-mukken," "patchai-pambu" and "kan-kotti-pambu" to this species.*

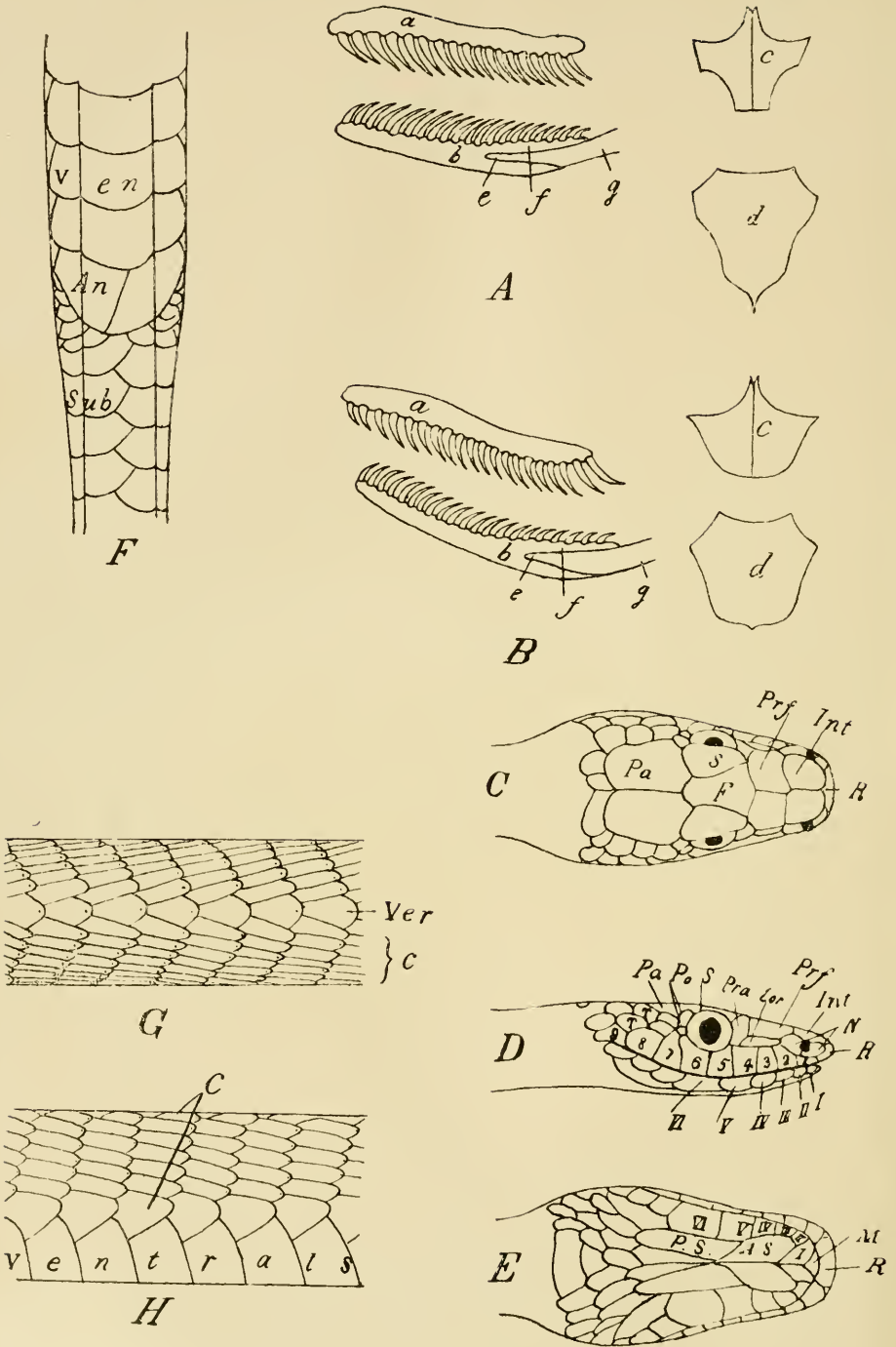
Jerdon† mentions "chitooriki-pambu" as one of the names in use in Southern India, and Dr. J. R. Henderson tells me he has known it called "panaiyeri-pambu" meaning palmyra snake in the same part of India. According to Russell‡ it is called "rooka" in Mahratti, "goobra" about Hyderabad (Deccan), "maniar" about Bombay, and "mancas" in Guzerat. Mr. E. Muir tells me that at Kalna, Bengal, it is called "bet anchora" which means "lacerated with a cane."

In Cannanore I heard it called "villoomi" from the Malayalam villoo a bow (see legends hereafter).

Colour and markings.—Dorsally the body is uniformly purple brown, bronze-brown or rarely ruddy-brown, except for the vertebral region which is usually more or less distinctly lighter, and the last row and a half of scales in the flanks, which are yellowish. The vertebral stripe involves the vertebral and half the next row. It may be conspicuous in the whole body length, or only anteriorly. In the neck and fore body a series of oblique, black streaks, often paired, and usually more or less broken up are always more or less evident. A yellow flank stripe passes from the neck to the vent. It is bordered above by a blackish, somewhat indistinct line, but unlike *pictus* is not bordered below by a black line running along the edge of the ventrals.

When the snake under excitement dilates itself, small oblique patches of light sky blue on each scale on the back are brought into view, especially noticeable and brilliant in the forebody. Each patch of blue is broadly edged with black anteriorly, and posteriorly and placed on the lower half of each scale so that it is usually com-

* The confusion is on a par with the Singhalese "karawella," wrongly ascribed by Günther to the Ceylon pit viper (*Ancistrodon hypnale*). Subsequent authors repeated the mistake on his authority, but there is now no doubt, I believe, that it is properly applied to the Ceylon krait (*Bungarus ceylonicus*). † J. A. S. Bengal XXII, p. 529. loc. cit.



COMMON INDIAN SNAKES (WALL).

(*Dendrelaphis tristis*).

THE COMMON INDIAN SNAKES.

EXPLANATION OF DIAGRAM I.

A.—*DENDRELAPHIS TRISTIS*, jaws.

B.—*DENDROPHIS PICTUS*, jaws.

(a) maxilla.

(b) dentary part of mandible.

(c) nasal bones.

(d) ridges on parietal for muscular attachments.

(e) articular notch.

(f) articular process of dentary.

(g) articular part of mandible.

C. D. E.—HEAD SHIELDS.

A. S. Anterior sublinguals.

F. Frontal.

Int. Internasals.

Lor. Loreal.

M. Mental.

Na. Nasals.

Pa. Parietals.

Po. Postoculars.

Pra. Præoculars.

Prf. Præfrontals.

P. S. Posterior Sublinguals.

R. Rostral.

S. Supraoculars.

T. Temporals.

1, 2, 3, etc. Supralabials.

I, II, III, etc. Infralabials.

F.—BELLY SHIELDS.

Ven. Ventrals with ridges.

An. Anal.

Sub. Subcaudals with ridges.

G. H.—BODY SCALES.

C. Costals.

Ver. Vertebrals.

pletely concealed by the overlapping of the scale below it. In our Plate (figures 3 and 4) this ornamentation is not done justice to, the blue being neither bright enough nor broad enough. The head is coloured above like the back, but the upper lip is yellow, creamy-buff, or opalescent abruptly demarcated above. There is a roundish yellow spot in the suture between the parietal shields (not shown by our artist), thin black edges to the 2nd, 3rd and 4th supralabials (sometimes the 1st also), and a somewhat obscure, narrow, black postocular streak not or hardly extending to the neck. The belly is uniform creamy-yellow, pale-greyish, greenish, or bluish green.

The markings to which special attention is to be paid are (1) The interparietal spot; (2) The light vertebral stripe; (3) The black posterior margins to the anterior supralabials; (4) The narrow, short, and often obscure black postocular streak and (5) a more or less obvious black line separating the dorsal brown from the yellow flank stripe. I find these present (except (1) and (2) in a single example from Marinagoa) in all the specimens I have examined from the localities mentioned hereafter under distribution, and none of these are present in specimens of *Dendrophis pictus*. In the Eastern Himalayas where these two species are associated (on slopes below Darjeeling) I saw many specimens last year, and learnt to discriminate between them at a glance, by the marks above referred to.

Dimensions.—The longest measurement I know is 3 feet 9 inches. I obtained a specimen of this length in Trichinopoly.

General characters.—The Indian bronze-back is remarkably elegant in colouration, and form. Its head is rather elongate, snout bluntly rounded, nostril small, and the eye large and lustrous with a golden iris and round pupil. The neck is very distinctly constricted, the body long, slender, smooth, and rather depressed (*i.e.*, flattened from above downwards). The belly is conspicuously ridged on either side as in *Chrysopelea ornata*. An unusually long tapering tail accounts for nearly one-third the total length of the snake. This appendage is ridged beneath in the same manner as the belly.

Identification.—The dual combination of enlarged vertebrae, and ridged ventrals (*see* Diagram I, figs. F and G) proclaims any snake either a *Dendrophis* or *Dendrelaphis*, so that it remains to distinguish this species from others in these two genera. Only 6 of these have 15

rows of scales in midbody, and the differences between them will be seen at a glance at the following table.

Number of scale rows in midbody.	Vertebrae as broad or broader than long.	Ventrals.	Anal.	Subcaudals.	Loreals.	Labials touching the eye.	Name of species.
15	Yes ...	177 to 211 ..	2	131 to 153 ...	1	normally 4th 5th & 6th.	<i>Dendrophis pictus.</i>
15	Yes ...	154 to 171 .	2	144 to 155 ...	2	5th & 6th ...	„ <i>bijrenalis.</i>
15	No ...	168 to 197 ...	2	115 to 134 .	1	5th & 6th ...	<i>Dendrelaphis tristis.</i>
15	?	167 to 172 ...	2	74 to 105 ...	1	5th .	„ <i>subocularis.</i>
15	?	174 to 188 ...	2	117 to 124 ..	1	4th, 5th & 6th	„ <i>grandoculis.</i>
15	Yes ...	184 to 195 ...	1	141 to 153 ..	1	4th, 5th & 6th..	„ <i>proarchos.</i>

The most important characters to distinguish *tristis* from its allies are the narrow vertebrae in which the length very distinctly exceeds the breadth, and only two labials touching the eye. To sum up then any snake in which the vertebrae are enlarged, but obviously longer than broad, with ridged ventrals, 15 scale rows in midbody, (*i.e.*, between snout and vent) and two labials touching the eye is *Dendrelaphis tristis*.

Hunts.—The common Indian bronze-back like all its allies lives almost entirely in bushes and trees, I became most familiar with it in Trichinopoly in my early Indian days, when I spent a good deal of my leisure time birdsnesting. During my daily excursions I frequently came across it, and have indeed met as many as three or four in a single outing. I frequently discovered it lying on a branch, when peering through low scrub, and if the snake lay still the chances were it would escape detection, looking extremely like a small branch itself. There is no doubt that its colouration is decidedly protective.

An observation of Mr. E. E. Green's in a recent letter exemplifies this. He says—on the 8th of September 1903, he “placed a branch with green foliage in the snake's cage. Formerly all the different snakes coiled up together amongst the dry foliage of a dead branch, but now they have sorted themselves, the green whip snakes (*Dryophis mycterizans*) have moved on to the green branch while the *Tro-*

pidonotus and *Dendrophis* (*Dendrelaphis*, F. W.)—both brown snakes—have remained on the dead branch.”

Often gazing up into trees a movement in the foliage twenty or more feet above drew my attention to a snake which when shot proved to be this species. I encountered it more than once in holes in trees, sometimes detecting the snake from the ground level with its head peering forth, or when aloft investigating a likely hole for a bird's nest. Under the latter circumstances a cane thrust into the hole and briskly stirred about effected its exit. Once the snake vacated its quarters so hastily that it fell to the ground. On one occasion in Colombo, I discovered one in the open, and pursued it, but it got into grass, and disappeared beneath a log. With some difficulty the log was overturned, but the snake could not be seen, and yet the ground was such that it was impossible for it to have escaped in any direction unseen. After a considerable search a narrow hole was discovered in the log in which the snake proved to have taken refuge. On more than one occasion I have found its slough entwined among the twigs of a crow's nest, which it had evidently visited with the intention of disencumbering itself of a worn-out vestment, as the slough was perfect or nearly so. On one of these occasions I found the snake in a hole in the same tree, and matched it with the slough.

It not infrequently comes to the ground, and I have often flushed one near the base of a tree, and seen it disappear up the trunk like a flash before I had time to recover the start that such an encounter always gives me. Dr. Henderson, too, remarks in a letter to me that he thinks it visits the ground more often than the whip-snake (*D. mycterizans*). It frequently clammers into the creepers about bungalows, and from here creeps on to the tiles.

Disposition.—Though Günther* says of it “When old it is rather ferocious and bites readily” my experience goes to show that it is a timid snake, usually making off with great despatch when alarmed. I have never been struck at by the specimens I have met face to face, or rudely evicted from holes in trees. The specimens I have handled, too, have never attempted to bite me, but it gives me little chance of ascertaining its temper, for if liberated with the object of being played with, it takes advantage of its release so precipitately, and moves with such speed, that the captive of one minute has regained

* Rept. Brit. India, p. 297.

its liberty the next, and is lost among the branches of the nearest tree. Mr. E. E. Green says that specimens he has kept have always been quite gentle and never attempted to bite when handled. Dr. J. R. Henderson, in a recent letter to me, remarks that in captivity it becomes very tame and inoffensive. Mr. Ingleby quoted by Ferguson says that it is a very lively, and plucky snake, and the fact that Mr. E. E. Green found one devouring a large blood-sucker lizard (*Calotes versicolor*), a most truculent creature when brought to bay sufficiently establishes its reputation for courage, when hunger presses.

Habits.—In a former paper of this series I made some remarks upon “flying” snakes (Under *Chrysopelea ornata* in Vol. XIII). It is probable that the common Indian bronze-back can undertake feats of the same nature, for it is endowed with the same peculiar ridges on the belly, that are seen in *Chrysopelea*; further, its close ally *Dendrophis pictus* is one of those snakes that has been reported to spring (fly) from heights. So far as *tristis* is concerned, however, the evidence, though suggestive is not so well authenticated. Though neither Dr. Willey nor Mr. E. E. Green are aware of any native stories of springing or “flying” snakes in Ceylon, Pridham* speaks of a snake called by the natives “ahedoella,” and says: “The movements of this snake are rapid, and from its power of springing it is called a flying snake.” The evidence seems pretty clear therefore that a “flying” snake exists in Ceylon, but there would appear to be a mistake in the diagnosis of the species for “ahedoella” is the Singalese name for the green whip-snake. (*Dryophis mycterizans*) a far commoner snake which has no reputation for springing as far as I am aware in any of the Provinces included within its wide distribution, and has an entirely different conformation of belly shields. So far as Southern India is concerned Dr. J. R. Henderson tells me that “There is a common belief that *D. pictus* (by which he means *D. tristis*) can jump, but I have never seen it do so.”

Its movements are surprisingly rapid as already remarked. It is truly astonishing with what speed it can ascend an almost bare tree trunk from the ground, and disappear in the branches above. I have seen this several times, and it has always struck me that its speed in ascent is as rapid as its movements along the flat. Mr. E. E. Green has been struck by its restless habit and the quickness of its movements.

* Ceylon and its Dependencies, p. 750.

The tenacity with which it can maintain its hold in foliage under most disadvantageous circumstances I have more than once been witness to. I managed to hustle one on one occasion to the extreme tips of the branches of a small neem tree, but though the slender twigs swayed boisterously under its weight and movements, it remained firmly suspended until I dislodged it with a stick.

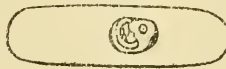
Any opportunities of exhibiting its natatory powers are probably rare, but that these are creditable seems certain, for I once encountered one (unless it was *D. pictus*) on a small island in Chilka Lake fully 2 miles from the main land.

Food.—This tree-snake appears to me to subsist under natural conditions chiefly on lizards, but does not disdain other reptilian fare. Mr. E. E. Green tells me that in captivity “it feeds readily upon small lizards (*Agamidae*, *Geckonidae*, and *Scincidae*)”. He saw one once take and eat a gecko which it swallowed immediately alive. He also once encountered one eating a full-grown “blood-sucker” lizard* (*Calotes versicolor*) and tells me further that young examples are said to feed on grasshoppers. Ferguson quotes Mr. Ingleby as saying that it is very keen after frogs, and particularly tree frogs. Mr. C. Beadon tells me that he once found one eating a blind snake (*Typhlops* sp.) which returned to its kill after having been once disturbed. On occasion it will attack and plunder birds’ nests. I once witnessed an encounter between this snake and a pair of black-backed robins (*Thamnobia fulvicata*) in the Borella Cemetery in Colombo. My attention was attracted by the distressed behaviour of the birds, which I approached cautiously, and saw on the ground—between a group of gravestones a *tristis* with its head well erected. I was so near that I both saw and heard more than one peck delivered (it appeared to me on the head) by the birds in their agitated flights to and fro. An incautious movement on my part, and the snake had slipped away, and no amount of search could reveal its whereabouts. In a croton bush within a yard or two of the encounter I found the robin’s nest with eggs. Specimens in the Madras Museum† have fed freely. One ate 79 toads and 1 lizard between the 12th August and 31st March; another 94 frogs from the 1st April to the 21st January following; a third 18 frogs between the 13th February and 31st of March; and a fourth 104 frogs, presumably during the year.

* Spol Zeylanica, April 1906, p. 220. † Administration Report, Madras Govt. Mus., 1896-97.

Sloughing.—Some excellent notes on this little studied function were made in the Madras Museum some years ago.* During the official year 1896 one shed its skin on the 2nd April, 6th May, 28th June, 27th July and 29th October. Another on the 13th May, 16th June, 21st July and 17th October. In a third instance a specimen which was acquired on the 12th August sloughed on the 24th October. Now, it is very curious, and apparently something beyond coincidence, that in all three cases there was no desquamation in the months of August and September, though in the first two cases there had been a regular ecdysis in several preceding months.

Breeding.—My notes are very meagre in this direction, but sufficient to show that the species is ovoviviparous. I received a gravid ♀ on the 29th February 1904 from Mr. Angus Kinloch (Kil Kotagiri, Nilgiris). It measured 3 feet $4\frac{1}{2}$ inches, and contained 7 nearly mature eggs, from $1\frac{1}{8}$ to $1\frac{1}{4}$ inches long, and about $\frac{7}{16}$ inch broad. Mr. E. E. Green had a specimen which laid 4 eggs in its cage on the 11th January 1908, and died next day when 2 more eggs were found in the oviduct. These were all sent to me. The smallest measured $1\frac{1}{8} \times \frac{3}{8}$ inches, and the largest $1\frac{3}{8} \times 1\frac{1}{2}$ inches. In cutting open egg I found an embryo coiled up in a spiral fashion, lying in an elliptical chamber situated in the upper part of the yolk substance, and midway between the two poles. The embryo I judged might be an inch and a half long when unravelled. Its head with the primary cerebral vesicle, eye and lower jaw were well developed, as was also the heart, so that it was in just about the same stage of development, that I noted in the case of the Assam species *Dendrophis proarchos*, at exovation. †



Egg showing embryo of *Dendrelaphis tristis* from a specimen from Ceylon. (Natural size.)

Though the species is obviously oviparous it is probable that minute

* Administration Report, 1896-97.

† Since writing this I have received another gravid ♀ from Mr. Green from Peradeniya (Ceylon) killed at the end of January and containing 7 nearly mature eggs.

embryo are already in process of formation at the time that the eggs are extruded, for in an allied species in Assam (*proarchos*, Wall) I found embryos in the eggs when laid, and noted that I could see the head and eye and rudiment of lower jaw, and could observe the heart beating. Further observations are required to ascertain if *tristis* lays eggs in which the embryos are equally well developed.

Legends.—There is a general belief among the natives of Southern India that the Common Indian bronze-back is fatally poisonous. Russell* records the belief as prevalent in his time, and says that his snake-catcher professed to have known two men killed by it, the bite producing immediate giddiness and death in two days. There is no reason to reject this snake-man's story, for as I have more than once remarked in these papers deaths do occur from the bites of perfectly harmless snakes. Such fatalities are due to cardiac syncope due to fright. In Bengal too as I am informed by Mr. E. Muir (Kalna) the natives say it is very poisonous and attacks without provocation. Russell† also mentions the belief among natives that this snake having bitten a person ascends a tree near the pyre to watch with vindictive satisfaction the smoke rising from the corpse of its victim, after which it descends. I heard this same story in Ceylon, but was never able to discover exactly which snake it was that was credited with this malignant spirit. Dr. J. R. Henderson tells me the belief is still prevalent in Southern India, and he has known a mock funeral with an effigy organised to save the bitten subject, for when the snake descends from the tree the poison it is supposed to have injected leaves the body, and the otherwise doomed person recovers.

In Cannanore there was another strange belief among the natives who said that this snake could thrust its tail into the ground, balance thereon, and assume the form of a bow, hence their name for it "villoonie" from "villoo" a bow. I was never able to understand with what object it is supposed to evince this strange behaviour.

Distribution. (A) *Geographical.*—The evidence at my command points to this being undoubtedly the common species to be found in the Indian Peninsular and I believe it exists here to the exclusion of *Dendrophis pictus* as far East as Bengal. My earlier notes on the species are unfortunately deficient in the matter of precise colour, and markings, but I can say with certainty that this is the snake I

* Loc. cit., Vol. 11, p. 80.

† Loc. cit., Vol. 11, p. 81.

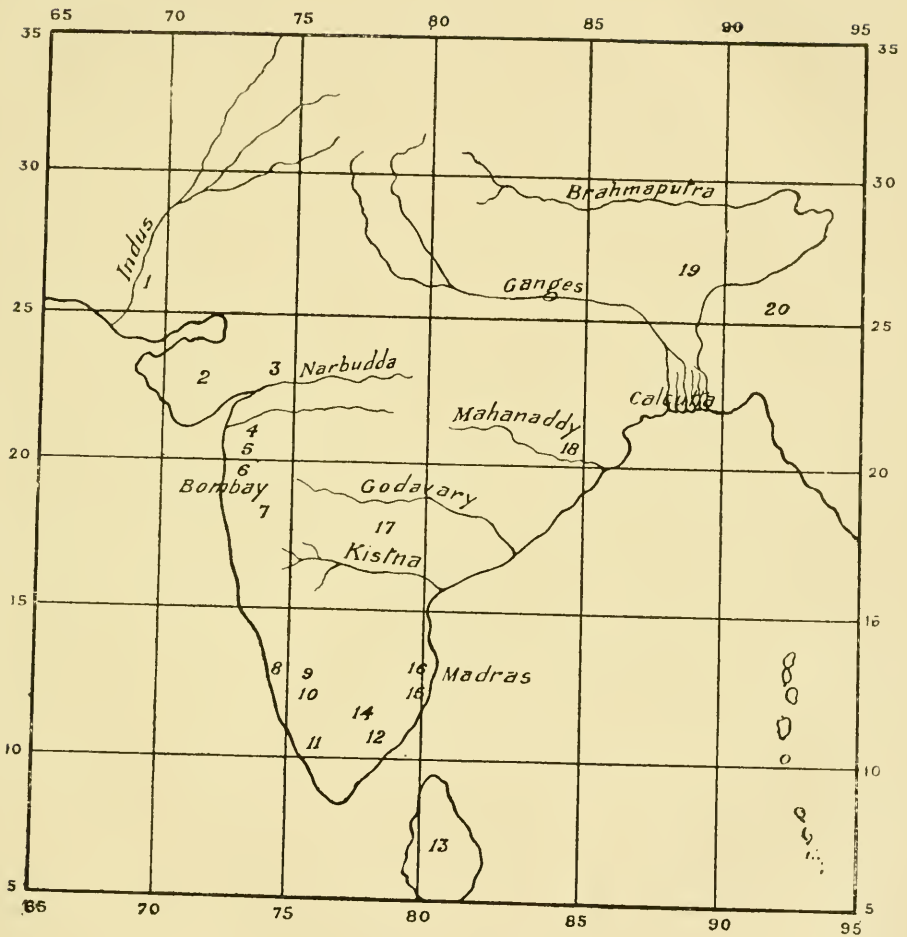
was familiar with in Trichinopoly, and I have taken it in Cannanore. It is certain, however, that the specimens taken in the localities mentioned in the attached map are *tristis*, and not *pictus*.

(b) *Local*.—It is a common snake in Ceylon (Ferguson, Haly). It is very common about Trichinopoly and Cannanore. Ferguson says it is common in the Plains and Hills about Travancore* and Mr. Millard tells me also about Matheran. Mr. E. Muir reports it as one of the common snakes about Kalna in Bengal, and has sent me specimens. Jerdon says it is abundant in all parts of the country, but with this I cannot agree. It appears to me to be uncommon in the plains to the north of the Tapti Rivers. I do not think it occurs in the Indus Basin at all, except near the mouth of that river. Blanford, collecting for 3 years at Ajmer, failed to obtain a specimen. The Ganges Valley is too, I believe, outside its limits, except at the Eastern part near the Delta. It has not been recorded from Central India, nor seemingly from the Central Provinces. It is quite common in the Eastern Himalayas (circa 2,500 to 5,000 feet) in the vicinity of Darjeeling.

Lepidosis. Rostral.—Touches 6 shields; the rostro-nasal, and rostro-internasal sutures subequal. *Internasals*.—Two; the suture between them equal to, or nearly equal to that between the præfrontal fellows, and rather shorter than the internaso-præfrontal sutures. *Præfrontals*.—Two; the sutures between them equal to, or rather greater than, the præfronto frontal sutures; in contact with internasal, postnasal, loreal, præocular, supraocular and frontal. *Frontal*.—Touches 6 shields; the fronto-supraocular sutures three to four times the fronto-parietal sutures. *Supraoculars*.—As long as the frontal, and about as broad along a line connecting the centres of the eyes. *Nasals*.—Two, completely divided; the nostril placed almost entirely in the anterior shield; in contact with the 1st and 2nd supralabials. *Loreal*.—One elongate, twice or more than twice as long as high, about as long as the two nasals taken together. *Præocular*.—One, barely reaching the top of the head. *Postoculars*.—Two. *Temporals*.—Two, elongate. *Supralabials*.—Normally 9 with the 5th and 6th touching the eye†. *Infralabials*.—6, the 6th much the largest, as

* Bombay N. H. Jourl., Vol. X, p. 5.

† This is so in 26 out of 29 specimens I have noted upon. In 2 instances these shields are not recorded, and in a single example the 4th just touches the eye on both sides. In one of the 26, there are 8 shields on one side only, the 4th and 5th touching the eye.



MAP SHOWING DISTRIBUTION OF *DENDRELAPHIS TRISTIS*.

- (1) Sind (B.M.). (2) Guzerat (Russell). (3) Baroda (Bo. M.). (4) Surat (Bo. M.). (5) Thana (Bo. M.). (6) Bombay (Russell). (7) Matheran (Bo. M.). (8) Cannanore (F.W.). (9) Kil Kotagiri, Nilgiris (F.W.). (10) Coimbatore (F.W.). (11) Travancore (Bo. M.). (12) Rannal (I.M.). (13) Ceylon (B.M.). (14) Trichinopoly (F.W.). (15) Tranquebar (Russell). (16) Madras (F.W.). (17) Hyderabad (Russell). (18) Jashpur, Chota Nagpur (Blanford, J. A. S. Bengal, Vol. XL. p. 431). (19) Himalayas below Darjeeling (B.M. & F.W.). (20) Khasi Hills (B.M.).

long on the 3 preceding shields, in contact with two scales behind; the 5th and 6th touching the posterior sublinguals. *Sublinguals*.—Two pairs; the posterior decidedly longer. *Costals*.—15 at a point two head-lengths behind the head, and to well beyond midbody, when they reduce to 13, and then to 11 or even 9, before the vent. The reduction from 15 to 13 is due to the absorption of the 4th scale above the ventrals into the row above or below; that from 13 to 11 results from a fusion of the 5th and 6th rows above the ventrals; and when the number further reduces to 9, the 5th row is absorbed into one of the adjacent rows. The vertebrae are enlarged, but they are very distinctly longer than broad in midbody, they arise in the neck by a fusion of 3 rows, thus differing from the genus *Bungarus*, where they gradually develop from a single row progressively enlarging, and unlike the genus *Bungarus* they cease above the anus. The ultimate row is much enlarged considerably exceeding the vertebral in breadth. Keels are absent everywhere. Apical pits are present, and single. *Ventrals*.—168 to 197, varying in number with locality*; sharply ridged (keeled) on each side. *Anal* divided. *Subcaudals* divided, 115 to 146; keeled like the ventrals. *Dentition*. † *Maxillary*.—17 to 22: the first 3 or 4 progressively increasing, the posterior, 3 or 4 compressed and progressively decreasing, so that the last is about two-thirds the length of the longest in the series. *Palatine*.—11 to 14, subequal, and as long as the longest maxillary. *Pterygoid*. 19 to 24 (except the Kil Kotagiri specimen which has 28 and 29); smaller than the palatine. *Mandibular*.—20 to 26 (usually 20 to 22); the first 3 or 4 progressively increasing, the posterior gradually decreasing. The length of the articular process equals the length from the articular notch (see fig. A. 6) to about the 4th tooth.

DENDROPHIS PICTUS (Gmelin).

The Himalo-Malayan Bronzeback.

Nomenclature. (a) *Scientific*.—The generic name from the *δένδρον* a tree and *οφίς* a snake, was applied by Boie in 1827; the specific

* In 19 specimens from various parts of India other than the Eastern Himalayas, they are 168 to 192. In 9 Eastern Himalayan examples they are 190 to 197.

† This is based on 19 skulls in my collection from Pashok (Eastern Himalayas), Madras, Matheran, and Kil Kotagiri (Nilgiri Hills).

from the Latin meaning "painted" was given by Gmelin in 1788 in allusion to the sky blue patches on the scales seen in this, and other species of the genera *Dendrophis*, and *Dendrelaphis*.

(b) *English*—In contradistinction to the last I think it should be called the Himalo-Malayan bronze-back.

(c) *Vernacular*.—In the Patani-Malay States Annandale and Robinson* say it is called "ular lidi", "ular"-snake, and "lidi" the midrib of the cocoanut palm. They remark that the appropriateness of the name is realized when one sees a leaf of this palm from below, with the midrib black against the sky, and an apparent light space on either side of it, due to the comparative narrowness of the leaflets where they leave it.

Colour and markings.—Dorsally the snake is uniform bronze-brown down to the middle of the penultimate row, where a faint black line abruptly demarcates the dorsal colour from a yellow flank stripe. The costal scales where overlapped, exhibit a patch of sky blue bordered with black before and behind. These are usually concealed, but when the snake dilates itself become very conspicuously apparent. The head is coloured like the dorsum above, this hue abruptly giving place to yellow on the side of the face. A very conspicuous, broad, black band behind the eye passes back to the side of the body, and is continued in the whole body length as a conspicuous black line on the edge of the ventrals, bordering the yellow flank stripe below and rendering it specially evident. The belly is uniformly yellow, greyish, or greenish.

It will be noticed that many of the distinctive marks seen in *Dendrelaphis tristis* are absent, viz., the light vertebral stripe, the interparietal spot, and the black margins to the anterior supralabials.

On the other hand, a very distinct, broad postocular band is to be seen in *pictus* passing well down the body, and the light flank stripe, is bordered below by a black line. These colour differences were noted by me 10 years ago on comparing Burmese with South Indian examples, and made me think the two snakes probably different, but I was deterred from declaring my conviction, finding but one difference in lepidosis, viz., the contact of the supralabials with the eye. Since this I have learnt that there is a very noticeable difference between

* Fascic. Malay. Batrach. and Rept., October 1903, p. 163.

the two in the development of the vertebrals, and still more recently in the dentition.

I may mention here that the sky blue adornment just referred to is not of sexual import, since it is to be seen in both sexes from the earliest ages, and at all seasons.

In the Andaman Islands a snake of this genus occurs which has hitherto been considered merely a variety of *pictus*, but which may prove to be a distinct species. It is referred to by Blyth in his book "The Andaman Islanders" (p. 365) as being remarkably rich coloured, green, and variegated, and appears to be common according to this authority. Stoliczka* also speaks of it as being common, and says it is a "beautifully bright yellowish and green during life, each scale blackish in the posterior half." The same authority† says that the usual continental form inhabits the Nicobars, and the Cocos, but the green form is peculiar to the Andamans. It is not however the only form found in this last Insular group, since Dr. Annandale has sent me a specimen very similar to the Burmese form except that the postocular stripe is narrow and obscure, the scales are heavily outlined with black and there is no black line in the flanks at the edge of the ventrals. He remarks that the majority of the specimens from these Islands are of the green variety, *i.e.*, *andamanensis*.

Anderson‡ describes this green variety in greater detail than the other authorities alluded to. He says it is grass-green above, each scale with a broad black margin, and the ventrals with a black margin, as far as the keel. The black margins of the scales, are so broad that when body is at rest, by the overlapping of the scales, the whole side of the body appears black. A black line beginning in the lore reappears behind the eye, and extends to the neck where it becomes broken up into spots.

I have not seen this form in life, but in spirit it appears uniform Oxford blue, acquiring just the same hue that many other green snakes (*Dryophis*, *Lachesis*, *Dipsalomorphus cyaneus*, etc.,) do in spirit owing, I believe, to the green colouring matter dissolving out. The preservative certainly acquires a distinctly greenish tinge. In the specimen I examined only the 5th and 6th labials touched the eye, and the last ventral was divided. If these two characters are constant

* J. A. S. Bengal XXXIX, p. 193. † J. A. S. Bengal XLII, p. 163.

‡ P. Z. S. 1871, p. 184.

there is no doubt that the snake should rank as a definite species. A study of the dentition would decide the point.

Dimensions.—The largest specimen of the typical variety I know of is the one collected by Evans and myself in Rangoon, which measured 4 feet 3 inches.

General characters.—Practically identical with those enumerated under *D. tristis*. I know of nothing special calling for remark; except that the tail appears to be relatively longer than in *tristis*, being usually fully one-third the total length of the snake, and often rather longer. The tongue is red with black tips (Flower).

Identification.—The remarks made under *D. tristis* are applicable here. A combination of the following characters will establish its identity:—(1) Vertebrae enlarged, and as broad as long or nearly so in midbody; (2) Ridged ventral shields; (3) Scales in 15 rows in midbody; (4) Divided anal; and (5) Subcaudal shields 131 to 153. As this snake is by far the commonest of the species in the genera *Dendrophis* and *Dendrelaphis* within the territory referred to hereafter, it is probable that any snake with the first two characters just mentioned will prove to be *pictus*.

Haunts.—Its haunts are precisely those of its common Indian ally *tristis*. That it will leave its arboreal environment, in quest of food is shown by Flower who found a marsh haunting frog *Rana macrodactyla* in the stomach of one specimen. In Burma it was found in trees, and bushes, in verandah-creepers, the trellis-work screens around tennis-courts, and similar situations usually, and Annandale remarks that in the Malay States it is more usually found in bushes near the ground than in trees.

Disposition.—I believe it is a timid, inoffensive reptile, much like its Indian cousin *tristis*. A specimen I had in captivity was notably so, for when first caught by the tail it did not venture to menace or bite, but merely struggled to escape. In its cage it retired to the furthest part when the glass was approached, and could not be roused to anger by drumming on the glass or waving objects before it.

Habits.—Its springing ("flying") habit is, I think, clearly established. Shelford, who remarked upon this extraordinary habit* mentioned *Dendrophis pictus* as one of the species credited by the

* Prol. Zool. Soc. Lond., 1906, p. 227.

natives of Sarawak with the power of springing, and Dr. Annandale writing to me some time back told me that he had witnessed the flight of a *Dendrophis pictus* between two trees in the Malay States, and caught the snake in his butterfly net.

Food.—The only specimen of eight collected in Burma which had recently fed, contained a tree frog, and Flower has known *Rana macrodactyla*, a marsh frog taken. I suspect that its gastronomic tastes are much the same as those of *tristis*.

Breeding.—I have no breeding events to chronicle from any source.

Distribution. (a) *Geographical.*—Variety *typica*, occurs in the Eastern Himalayas about Sikkim up to an altitude of about 4,000 feet, probably the plains of Eastern Bengal, but I am not certain of this, Assam probably,* but I am not certain; one specimen I collected I referred with some doubt to this species, the Irrawaddy-Salween Basins (The Andamans, Nicobars and Cocos?), † Indo China, Malay Peninsula, and the Malay Archipelago from Sumatra to the Philippines.

It is impossible to say whether the snake reported by Stoliczka ‡ as common in the Himalayas, in Kumaon and Sutlej is *pictus*, or *tristis*. I have never met with a specimen from the Western Himalayas, and this is the only allusion I can find of such in literature.

I think I am justified in doubting the habitat of Colonel Beddome's specimen in the British Museum said to be from the Anamallays.

* The common species in this province is *proarchus* (Wall) which is described in a paper appearing in this number (p. 827) on the snakes of Assam.

† I have lately received a specimen from the Andamans from Dr. N. Annandale. In coloration and markings it was very like *tristis*, except that there was no interparietal spot, and no light vertebral streak. Having prepared the skull I find that it combines the characters of *pictus* and *tristis*, and this being so, I think one has no course open to one but to concede to it the rank of a very closely allied but distinct species. I await further specimens before describing this in detail.

‡ My reasons for doubting this record are that at least six other Hirmalo-Burmese snakes are recorded from South India on the sole authority of Beddome; these are *Tropidonotus parallelus*, *T. subminiatus*, *himalayanus*, *Lycodon jara*, *Simotes splendidus*, and *Bungarus fasciatus*. Beddome evidently received snakes from the Eastern Himalayas and Burma because he presented the following snakes to the British Museum from these localities: *Simotes albocinctus*, *S. orientatus*, and *Dipsadomorphus hexagonotus*. It seems probable, therefore, that the six species first enumerated and also a *Dendrophis pictus* were likewise collected in Burma, or the Eastern Himalayas, and inadvertently mixed with his South Indian collection.

This is the only record of this snake from Peninsular India (excluding Bengal), and until another specimen is forthcoming the record is best ignored.*

Variety.—*Andamanensis* appears to be peculiar to the Andaman Islands.

(b) *Local.*—Variety *typica* inhabits the plains and low hills ascending to a level of about 4,000 feet (Stoliczka says 6,000 feet). It is fairly abundant in the Sikkim Himalayas. In Upper Burma (Bhamo) Anderson reported it common, but two of the three specimens collected by him are obviously the species, subsequently described by Boulenger as distinct, *viz.*, *subocularis*. Evans and I found it by no means common in Lower Burma, acquiring but 6 specimens out of a total of about 750 snakes. In the Malay Peninsula Flower says it is by no means rare, and Annandale and Robinson refer to it as probably the most abundant snake in the cultivated parts of the Malay States. Variety *Andamanensis* is said to be common in the Andamans.

Lepidosis.—The scale characters are so extremely similar to those of *tristis* that I need not repeat what I have said under that species. The two differences that I have been able to discover are (1) that three supralabials, the 4th, 5th and 6th usually, but by no means always, touch the eye and (2) that the vertebrae are as broad, or nearly as broad as long in the middle of the body.

Dentition. (a) *Maxillary.*—20 or 21; the first 3 or 4 progressively increasing in length, the posterior 3 or 4 decidedly more compressed, but not longer than the preceding. (b) *Palatine.*—13 or 14, subequal and as long as the maxillary. (c) *Pterygoid* 20 to 26, subequal, smaller than the palatine. (d) *Mandibular.*—20 to 22; the first 3 or 4 progressively increasing in length, the series then very gradually decreasing posteriorly.

Osteology.—The shape of the nasal bones (fig. B c) is strikingly different from that of *tristis*, so are also the ridges on the parietal bone (fig B d). The length of the articular process of the dentary (B f) equals the distance from the articular notch to about the 8th tooth.

(To be continued).



1.



2.



3.



4.



5.

J G del.

J. Green, Chromo

THE COMMON INDIAN SNAKES, (Wall).
Dendrophis pictus, harmless, nat. size